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HOW TO

Identify and Suppress Oak Wilt in Live Oak and Texas Red Oak

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How to Identify Oak Wilt

Oak wilt, caused by *Ceratocystis fagacearum,* is considered the most destructive oak disease in North America. It has killed thousands of live oaks and oaks of other species in Texas. Live oaks are susceptible to other infectious diseases but oak wilt is the greatest threat. A tree's vulnerability to oak wilt is not influenced by age, size, soil type or moisture availability. In Texas, the most serious infection centers have been found on sites with relatively dense live oak stands. The oak wilt fungus spreads from infected trees to adjacent, healthy trees through interconnecting roots. A single infected tree can initiate an infection center and involve many trees unless control measures are used. Nitidulid beetles and other unknown vectors carry fungal spores from infected to noninfected trees where infections might develop if contact is made with fresh wounds in spring. Insect vectors probably account for most single-tree infections that later develop into infection centers, but spread occurs mostly through root grafts or other connections.

Identification

Oak wilt can be identified by initial symptoms and confirmed by isolating the fungus from xylem tissue. Recovery of the fungus from diseased tissue is greatly influenced by seasonal temperatures, isolation techniques, and the quality of sample selection, storage, and transport to the laboratory. The more diagnostic symptoms are illustrated in this publication.

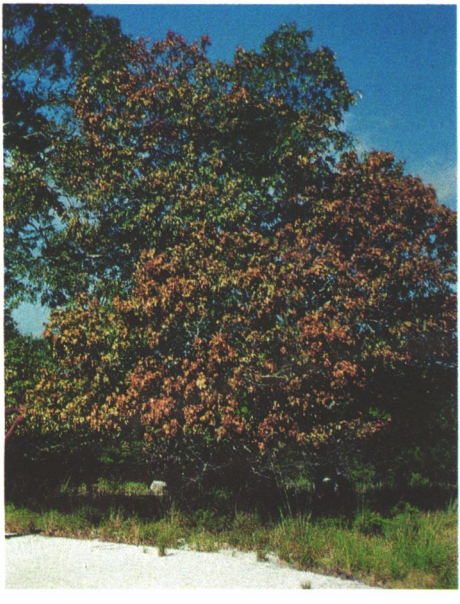
Live Oaks

Look for pale foliage as the first indication of oak wilt. Leaves later turn yellow and some defoliation occurs as shown. Advanced symptoms are fewer and smaller leaves, twig dieback, and suckering from the bole. Some live oaks die within weeks after infection while others survive for several years, although in a weakened condition.

Examine individual leaves on and underneath suspected trees for diagnostic leaf symptoms. Sometimes leaf tips and margins dessicate and appear pale green but later turn brown (top photo). The most diagnostic symptom is yellowing and browning of midribs and leaf veins (bottom photo). (Some defoliation is always associated with these initial oak wilt symptoms. Some of the fallen leaves should have the diagnostic symptoms. At times, especially during late spring, the entire leaf turns brown before falling off (see cover photograph).

Texas Red Oaks

Texas red oaks are highly susceptible to oak wilt. Look for curling leaves, pale green and brown foliage, and some defoliation (top photo). Some leaves turn brown and remain attached to the tree. The diagnostic leaf symptom is a dessication of leaf tips and margins (bottom photo). Leaves first turn pale green, then brown. The change in leaf color starts from tips and margins and progresses downward and inward. Diagnostic symptoms are not always evident on fallen leaves.



Fungal mats of *C. fagacearum* develop underneath the bark of some affected trees in early spring. In Texas, fungal mats have been observed only on Texas red oaks that had been infected the previous year. Look for inconspicuous cracks in the bark of trees. The fungal mat can be revealed after bark removal. Insect vectors transport spores from fungal mats to wounds or pruning cuts on healthy trees and start new infections. Single tree infections from insect vectors often develop into infection centers as the fungus passes through interconnecting roots between trees.

Oak Wilt Suppression

The sole objective of an oak wilt suppression program is to minimize its spread. Unfortunately, there is currently no sure treatment for saving infected trees. The number of new infections can be minimized or even stopped through cooperative wilt suppression efforts by local property owners, but some technical assistance might be needed. Oak wilt must be correctly identified before taking action. Following are procedures for suppressing oak wilt:

1. Examine trees bordering infection centers for diagnostic initial wilt symptoms and mark infected trees.

2. Establish barriers to prevent the infection from spreading through roots. This can be accomplished by trenching along a line encircling the infection center and not less than 50 feet or one symptomless tree away from the nearest infected tree at any point. Trenches should be 24–36 inches deep, or as deep as the majority of lateral roots. Secondary barriers can be established within the encircled

areas to save trees that might not be infected. Within the encircled areas:

a. Uproot infected trees when possible. The fungus cannot survive over summer in dead wood, but it can survive in live roots and boles.

b. Cut and burn Texas red oaks as soon as wilt is identified in them. Do not allow them to stand until March, nor transport them as firewood. This will prevent fungal mats from developing and reduce the chances for insect transmission. In Texas, fungal mats have been found on red oaks only.

3. As an alternative to trenching, kill infected trees with approved silvicides. They will reduce but not eliminate disease spread. Check with your Extension and State Forest Service for state-approved silvicides. May or June might be the best time for treatment because the fungus will not live in dead trees during summer. One danger is that some non-target trees might be killed because certain silvicides move into adjacent healthy trees through roots.

4. Avoid pruning or wounding oaks during March 1–May 15 in areas where oak wilt is present. This will reduce the threat of insect transmission since both fungal mats and insect vectors are active during this period.

5. Avoid transplanting oak-wilt-infected oaks.

6. Avoid moving oak-wilt-infected firewood to areas not known to have oak wilt. Cut firewood during June–August in areas with oak wilt. This will lessen the chances for fungal survival because wood will dry out and absorb heat over summer.

7. Check the success of your oak wilt suppression treatments by looking for new infections during May and June and September through November. If no new cases are found within 5 years, no further action is required. If new infections are found, repeat suppression treatments as before.

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